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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,656	10/22/2003	Mikhail Kejzelman	003301-054	6495

21839 7590 07/16/2008
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
KESSLER, CHRISTOPHER S	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
07/16/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/689,656	KEJZELMAN ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER KESSLER	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-30,34-40,48 and 49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-30, 34-40, and 48-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Responsive to the amendment filed 23 June 2008, no amendments are made to the claims. Claims 20-30, 34-40, and 48-49 are currently under examination.

Status of Previous Rejections

2. Responsive to the amendment filed 23 June 2008, the finality of the Office Action of 24 January 2008 is withdrawn. New grounds for rejection are presented.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 20-25, 30, 34-40 and 48-49 rejected under 35 U.S.C. 103(a) as being unpatentable over Rutz in view of US 3,901,661 issued to Kondo et al. (hereinafter "Kondo").

Regarding claim 20, Rutz teaches the invention substantially as claimed. Rutz teaches a process for preparing high-density green compacts (see Summary of the Invention, Detailed Description). Rutz teaches wherein the powder is an atomized, completely alloyed steel powder (see col. 3). Although Rutz does not explicitly disclose the method of atomization, it would have been obvious to one of ordinary skill in the art that any form of atomization may be used, including gas-based or liquid based. Thus one of ordinary skill in the art would have been directed to use water atomization as one species of a small genus.

Rutz teaches that a lubricant is added to the steel powder (see Summary, Detailed Description, cols. 5-6 for example). Rutz teaches that the powder preferably contains 0.1 to about 10 weight % lubricant (see col. 2 and col. 5), said range overlapping the range claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a lubricant content in the claimed range, because Rutz teaches the same utility over an overlapping range of lubricants. Applicant is further directed to MPEP 2144.05.

Rutz teaches that the compaction force is preferably in the range of about 276-1379, or more preferably about 345-828 MPa (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It

would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 800 MPa, because Rutz teaches that the pressure is preferably 345-828 MPa. Applicant is further directed to MPEP 2144.05.

Rutz teaches that the compact is ejected from the die (see cols. 5-6, cols. 8-9).

Rutz does not teach wherein less than about 5% of the powder particles have a size below 45 μm. Rutz teaches that the weight average particle size of the powder is from 1-1000 microns, more desirably 10-500 microns and that the maximum particle size is desirably less than 350 microns (see col. 3). Rutz teaches that a variety of other powders including pre-alloyed steel powders may be used in the invention (see cols. 2-3).

Kondo teaches a water-atomized pre-alloyed steel powder (see abstract, cols. 7-8, claim 1). Kondo teaches that the particle size distribution of the steel powder is such that 2% of the power is smaller than 325 mesh, thus meeting the limitation wherein less than about 5% of the powder particles have a size below 45 μm.

It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz while using the water-atomized, completely alloyed steel powder of Kondo, because Kondo teaches that compacts made from the powder will exhibit excellent hardenability and mechanical properties (see cols. 3-4).

Regarding claim 21, Rutz teaches mixing the powder with graphite and other additives (see cols. 5-6, for example), said process step being well established in the art of powder metallurgy.

Regarding claim 22, Rutz teaches compaction in a single step (see cols. 5-7), said process step being well established in the art of powder metallurgy.

Regarding claim 23, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches that the powder contains more than 50% particles of size greater than 106 μm (see col. 8).

Regarding claim 24, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches that the powder contains more than 60% particles of size greater than 106 μm (see col. 8).

Regarding claim 25, Rutz in view of Kondo is applied to the claim as stated above. Kondo teaches wherein the powder contains about 70% particles of size greater than 106 μm (see col. 8).

Regarding claim 30, Rutz teaches to add graphite at about 0.5% (see col. 6), said process step being well established in the art of powder metallurgy.

Regarding claim 34, Rutz teaches wherein the iron powder can be mixed with alloying elements (see cols. 2-3, col. 7, Table III, for example) to obtain a desired final composition.

Regarding claim 35, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 900 MPa, because

Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 36, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 1000 MPa, because Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 37, Rutz teaches that the compaction force is preferably in the range of about 276-1379 (see cols. 5-6), said range overlapping the range as claimed and establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have practiced the method of Rutz, and to have selected a compaction pressure over 1100 MPa, because Rutz teaches that the pressure is preferably 276-1379 MPa. Applicant is further directed to MPEP 2144.05.

Regarding claim 38, Rutz teaches wherein the compaction is performed at ambient temperature (see cols. 6-9).

Regarding claim 39, Rutz teaches wherein the compaction is performed at elevated temperature (see cols. 6-9).

Regarding claim 40, Rutz teaches that the compact is sintered at a temperature of over 1100˚C (see col. 6), said process step being well established in the art of powder metallurgy.

Regarding claim 48, Rutz teaches wherein the alloying elements may be Ni (see cols. 2-3, col. 7, Table III, for example).

Regarding claim 49, Rutz does not disclose wherein the die is lubricated (external lubrication). The choice of lubricating (or not lubricating the die is well established in the art. It would have been obvious to one of ordinary skill in the art at time of invention to use the compaction without external lubrication in order to save processing steps.

5. Claims 20-30, 34-38, 40, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki.

Regarding claim 20, Ozaki teaches the invention substantially as claimed. Ozaki discloses a method for preparing high density green compacts comprising subjecting an iron powder composition that is essentially without fine particles to uniaxial compaction (see Detailed Description, Examples, Table 1, powder A1, for example). Ozaki teaches that the powder used is preferably of a large particle size such that more 90-100% of the particles are greater than 150 μm in size (see Summary of the Invention, Detailed Description). The particle size range taught by Ozaki significantly overlaps the claimed particle size range wherein less than about 5% of the particles have size less than 45 μm, establishing a prima facie case of obviousness for the claimed range. It would have

been obvious to one of ordinary skill in the art at time of invention to have selected a particle size distribution within the range as claimed, because Ozaki teaches the same utility over a substantially overlapping range. Applicant is further directed to MPEP 2144.05.

Ozaki discloses an example of adding zinc stearate powder to the iron powder for compaction in amounts that fall within the range of about 0.05% and about 0.6% by weight (see col.14, lines 52-60). Ozaki further discloses in that example that die compaction of the iron powder takes place at pressures of 1,177 Mpa, falling within the range as claimed (see Examples 1-1 and 1-2).

Ozaki does not disclose ejecting the green body from the die. However, the practice of ejecting the compact from the die after pressing would have been obvious to one of ordinary skill in the art, in order to densify the green body by heat treatment, for example.

Ozaki teaches that the powder is a water atomized iron powder (see Summary of the Invention). Ozaki teaches wherein the iron powder may be mixed with powdered alloying elements as desired (see cols. 7-8). Ozaki does not disclose wherein the powder is a water-atomized, completely alloyed steel powder.

However, Ozaki teaches that the composition of the water-atomized iron powder may contain carbon in the range of ≤0.1% (see Summary of the Invention). The preparation of an iron powder comprising 0.1% carbon would be classified as steel, and would therefore meet the limitations of a water-atomized, completely alloyed steel powder. It would have been obvious to one of ordinary skill in the art at time of

invention to have practiced the method of Ozaki using a carbon content of 0.1%, because Ozaki teaches the same utility over this range. Applicant is further directed to MPEP 2144.05. Ozaki further teaches that the powder may be made from a steel melt (see col. 4, lines 39-43).

Regarding claim 21, Ozaki teaches addition of graphite and other elements to iron powder containing fines before compaction, for alloying the powder (see Example 2). It would have been obvious to one of skill in the art at time of invention to add the graphite to create alloys suitable for parts with high mechanical strength, as taught by Ozaki et al. (see Example 2).

Regarding claim 22, Ozaki teaches that the compaction is done in one step (see Summary of the Invention, Example 2).

Regarding claims 23-25, Ozaki teaches that at least 90% of the particles have a particle size of greater than 150 μm (see Summary of the Invention).

Regarding claim 26, Ozaki teaches that 0-45% of the particles have a size of greater than 250 μm, and that an additional 30-65% of the particles have a size of 180-250 μm (see Summary of the Invention). The range of particle size of Ozaki thus overlaps the instantly claimed range, establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a particle size distribution as claimed because Ozaki teaches the same utility over an overlapping range. Applicant is further directed to MPEP 2144.05.

Regarding claim 27, Ozaki teaches that 0-45% of the particles have a size of greater than 250 μm, and that an additional 30-65% of the particles have a size of 180-250 μm (see Summary of the Invention). The range of particle size of Ozaki thus overlaps the instantly claimed range, establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a particle size distribution as claimed because Ozaki teaches the same utility over an overlapping range. Applicant is further directed to MPEP 2144.05.

Regarding claim 28, Ozaki teaches that 0-45% of the particles have a size of greater than 250 μm, and that an additional 30-65% of the particles have a size of 180-250 μm (see Summary of the Invention). The range of particle size of Ozaki thus overlaps the instantly claimed range, establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a particle size distribution as claimed because Ozaki teaches the same utility over an overlapping range. Applicant is further directed to MPEP 2144.05.

Regarding claim 29, Ozaki discloses a maximum particle size of about 1 mm, for the reason that the larger particles will preferentially sit at corners and die walls, resulting in porosity in corresponding areas of the green body. There is no evidence that the limitation of 2 mm as maximum particle size is a critical value (see MPEP §2144.05 IIB). In fact, applicant's specification states that less than 5% of the particles

have size of 417 μm (page 3, last paragraph), teaching away from a 2 mm maximum particle size.

Regarding claim 30, Ozaki discloses that graphite may be added in amounts which fall within applicant's claimed range of 0.1-1.0% (see Table 6).

Regarding claim 34, Ozaki discloses wherein alloying elements may be mixed with the iron powder before compaction (see Example 2).

Regarding claims 35-37, Ozaki discloses compaction at pressure of 1177 Mpa (see Examples 1-1 and 1-2).

Regarding claim 38, Ozaki teaches that die compaction is to be performed at room temperature (see col. 2, lines 26-29).

Regarding claim 40, Ozaki discloses an example comprising sintering the green body at temperature of 1250 °C (see Example 2).

Regarding claim 48, Ozaki discloses wherein alloying elements including Ni, Cu and Mo may be mixed with the iron powder before compaction (see Example 2).

Regarding claim 49, Ozaki discloses the addition of zinc stearate, a commonly used lubricant, to the powder (see Example 1-2). It would have been obvious to one of ordinary skill in the art at time of invention to use the compaction without external lubrication in order to save processing steps.

6. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki as applied to the claims above, and further in view of B Lynn Ferguson and Randall M.

German, "Powder Shaping and Consolidation Technologies," ASM Handbook, vol. 7, 1998, pp. 313-320 (hereinafter "Ferguson").

Ozaki is applied to the claim as stated above. Ozaki does not teach compaction performed at elevated temperature. Ozaki teaches room temperature compaction.

Ferguson teaches methods commonly employed by those of ordinary skill in the art of powder metallurgy (see p. 313). Ferguson teaches that warm compaction is known in the art to achieve higher density and better mechanical properties (see p. 316). It would have been obvious to one of ordinary skill in the art at time of invention to have altered the method of Ozaki by using warm compaction as taught by Ferguson, in order to achieve higher green density and better mechanical properties, as taught by Ferguson (see p. 316).

Declaration under 37 CFR 1.132

7. The declaration under 37 CFR 1.132 filed 23 June 2008 is insufficient to overcome the rejection of claims based upon Ozaki in view of Rutz as set forth in the last Office action because: the declaration of Paul Skoglund has been carefully considered, but does not compare the closest prior art to the claimed invention. In the declaration, at page 2, paragraph 13, applicant states, "A powder according to the invention as claimed in U. S. Patent Application Serial No. 10/689,656 is Astaloy Mo from Höganäs AB, Sweden, and is a water-atomized completely alloyed steel powder containing 1.5 wt% Mo."

The examiner disagrees that Astaloy Mo is a water atomized completely alloyed steel powder. One of ordinary skill in the art would understand that steel by definition includes carbon in significant amounts. Astaloy Mo is an alloy of iron and molybdenum, and does not meet the limitation of steel. Applicant is directed to the definition of steel in Hawley's Condensed Chemical Dictionary (see attached form PTO-892).

Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support." In other words, the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range. In re Clemens, 622 F.2d 1029, 1036, 206 USPQ 289, 296 (CCPA 1980). In the instant case, the composition of the powder used in the comparison is outside the scope of instant claim 20, and therefore there is no showing of non-obviousness over Ozaki.

Response to Arguments

8. Applicant's arguments filed 23 June 2008 have been fully considered but they are not persuasive.

In response to applicant's arguments stating that one of ordinary skill in the art would not have been motivated to combine the teachings of Ozaki with those of Rutz, these arguments are moot in view of new grounds for rejection stated above.

In response to applicant's argument that Rutz does not teach a water-atomized powder, Rutz explicitly teaches that the powder is made by atomization (see col. 2).

One of ordinary skill in the art immediately understands that the atomization process includes one of water atomization, oil atomization or gas atomization. Thus, a water-atomized powder is described, or if not described, obvious, by the disclosure of Rutz. Further, Kondo teaches that the powder is water-atomized, as cited above.

In response to applicant's argument that there is no reasonable expectation of success in replacing the powder of Rutz with that of Kondo, the examiner disagrees. The disclosure of the use of an amide based lubricant in Rutz and the disclosure of a stearide based lubricant in Kondo are not so different as to cause one of ordinary skill in the art to believe that an amide lubricant would not work with the iron based powder of Kondo. Both Rutz and Kondo are drawn to powder metallurgical processes for making magnetic green compacts using iron powder and lubricant and pressing the powders. As was cited in the previous rejection, Rutz explicitly teaches that other iron based powders may be used in the invention (see cols. 2-3).

In response to applicant's argument that one of ordinary skill in the art would not have been led to use the iron based powder of Kondo without the zinc stearate lubricant taught by Kondo in the amount taught by Kondo in Example 1, the examiner disagrees. As was cited in the prior rejection, Kondo teaches a prealloyed steel powder (see abstract, cols. 7-8, claim 1). In the Example, Kondo merely discloses a potential use for the powder, which is a powder metallurgical method using the powder and zinc stearate lubricant, and also discloses what is the particle size of the powder. Claim 1 of Kondo claims the steel powder (no lubricant is specified). One of ordinary skill in the art would fully understand from the disclosure of Kondo that the powder as claimed could be used

in other powder metallurgical processes and with other lubricants as are known in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

csk